Thermal Isolation Barrier Waste Relocation Areas

West Lake Landfill Superfund Site

Prepared for

The United States Environmental Protection Agency Region VII

Prepared on behalf of

Bridgeton Landfill, LLC and Rock Road Industries, Inc.

Prepared by

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Thermal Isolation Barrier
Waste Relocation Areas
Bridgeton Landfill, LLC

LIST OF FIGURES

1 INTRODUCTION

This document has been prepared to address certain requirements of Paragraph 30(a) of the Administrative Settlement Agreement and Order on Consent (ASAOC) for Removal Action – Preconstruction Work in the matter of the West Lake Landfill Superfund Site, Bridgeton, St. Louis County, Missouri (EPA Docket No. CERCLA-07-2014-0002) between the United States Environmental Protection Agency (EPA) Region VII and Bridgeton Landfill, LLC and Rock Road Industries, Inc. which was signed on April 16, 2014. This Waste Relocation Report has been prepared by Feezor Engineering, Inc. (FEI) in cooperation with Engineering Management Support, Inc. (EMSI), on behalf of Bridgeton Landfill, LLC and Rock Road Industries, Inc., in compliance with the Work Plan submitted pursuant to Paragraph 31 of the ASAOC and approved by EPA on July 1.

Paragraph 30(a) of the ASAOC directs that Respondents: "Identify all potential areas on Site proposed to be used for the staging, management and relocation of excavated wastes." The following discussion evaluates specific areas suitable for waste relocation. However, because the location and design of the isolation barrier are not yet determined, this discussion is necessarily preliminary in nature. Specifically, this document provides a pre-evaluation of locations to accept waste relocation from the excavation of a thin-walled barrier design.

2 WASTE MATERIALS TO BE RELOCATED

As noted in the EPA-approved Work Plan for Removal Action Preconstruction Work, West Lake Landfill Superfund Site, May 16, 2014, revised June 20, 2014 (the Work Plan), determinations of the volume and locations of waste to relocate will be heavily influenced by the design of the isolation barrier. The Work Plan estimates that 50,000 to 95,000 bank cubic yards of municipal solid waste (MSW) will require relocation, though this is a preliminary estimate which will require revision as details of the isolation barrier design become known. For example, a wider excavation or a more gradual slope would increase excavation volumes.

For relocation purposes, consideration must be made for the amount which the waste will expand following excavation. The West Lake Landfill Operable Unit-1 (OU-1) Supplemental Feasibility Study Report (EMSI, 2011) made use of a "swell" factor of 1.5. Once deposited in place, the waste will be mechanically compacted. However, due to potential inefficiencies related to placement geometry or other causes, re-compaction may be incomplete and thus a final factor of 1.2 is applied to the excavated waste volume for these estimates. Additionally, an allowance for daily cover must be made. While alternative types of daily cover may found to be viable, for this discussion an allowance of 5% of the original bank volume is used, representing a soil cover which is partially recovered each morning when work resumes. Thus for the purposes of identifying potential locations for waste relocation associated with construction of the barrier

wall, the final volume of relocated (in place) wast e is assumed to range from 65,000 to 125,000 cubic yards (cy).

EPA has directed that any identified radiologically impacted material (RIM) encountered as part of excavation will be properly containerized and prepared for off-site disposal. However, since it is expected that the majority of the waste relocate d for the barrier will not be radiologically impacted, for this discussion it is assumed that th e full volume of excavated waste will require onsite relocation.

The excavation work plans will include screening to identify RIM. The processes for scanning and for handling waste for relocation will be set forth in construction work plans submitted for EPA review and approval.

3 POTENTIAL RELOCATION AREAS

A number of potential locations have been identified as candidates for possible waste relocation. This section describes those locations in detail, w hile the subsequent section makes recommendations for location selection, subject to the quantity of waste relocation required by the actual design of the isolation barrier. Figure 1 displays a graphical representation of the potential locations.

3.1 SITE 1: SOUTH QUARRY FILL LOCATIONS

Currently Bridgeton Landfill has a need to fill a n umber of locations in the South Quarry for operational purposes such as drainage improvement. The amount of fill is estimated to be approximately 60,000 cy in 2014, with potentially s ignificant volumes available in future years, should excavation be delayed. These locations would be advantageous for waste relocation due to the existing infrastructure that is already in place, such as for the management of leachate and landfill gas, and for the control of odors and litter.

An additional advantage of utilizing the South Quar ry locations for waste relocation is the relatively lightweight fill components of the waste . In areas where excessive settlement has occurred within the Bridgeton Landfill, it may beco me necessary to fill in depressions to ensure stormwater drainage and maintenance of other infrastructure. Typically at closed landfills, clean soil can be utilized to fill such depressions. How ever, adding soil typically creates additional weight at the surface of the waste column, and crea tes a compaction force which further compresses the waste mass. Utilizing waste to fill in depressions can create a lighter fill – reducing the additional consolidation which occurs after filling.

3.2 SITE 2: CROWN OF NORTH QUARRY

The crown of the North Quarry is a potential relocation site with the advantage of convenience to the excavation operation. The available volume and placement will be impacted by the barrier alignment selection, but this location contains approximately 34,000 to 87,000 cy of airspace.

Like the South Quarry, the North Quarry has the advantage of existing infrastructure for stormwater management, gas collection, and leachate conveyance, and the ability to integrate any added infrastructure with the existing North Quarry infrastructure. As recognized by MDNR, Temperature Monitoring Probes (TMP's) could be affected by waste placed in this area.

3.3 SITE 3: SOUTHEAST CORNER OF OU-1 AREA 1

The southeastern portion of Area 1 in OU-1 (outside the extent of RIM occurrences) is also advantageous due to its proximity to the excavation. Using a "piggyback" design to bridge onto the North Quarry, this produces a very efficient cell design with a potential airspace of approximately 132,000 cy. In addition, much of the required infrastructure could be tied into the existing North Quarry infrastructure, although the existing stormwater features around the eastern perimeter may require modifications. Although the cell will be crossing the border between OU-1 and Bridgeton Landfill, it is not believed that any technical issues will be created which cannot be addressed as part of the relocated infrastructure.

If bridging onto the North Quarry slopes was not possible, the available volume would be reduced to approximately 48,000 cy. Careful design attention must be paid to stormwater management, as a valley would be created between this cell and the North Quarry.

A disadvantage of waste relocation to this area is the potential for complications to a future remedy for Area 1. For example, the southeastern portion of Area 1 may be useful as a staging area for equipment and material stockpiles.

(Note that a portion of the airspace made available by bridging onto the North Quarry slopes is also included in the North Quarry Crown option. Both options would make use of this airspace, and they overlap as shown in Figure 1. If both options were implemented, the total airspace available would be somewhat less than the sum of the two volumes.)

3.4 SITE 4: CROWN OF THE OU-2 INACTIVE SANITARY LANDFILL

The crown of the Operable Unit-2 (OU-2) Inactive Sanitary Landfill presents an option for relocating a much larger quantity of waste, containing approximately 268,000 cy of airspace.

However, this location is farther from the excavation site, which would require separate bird monitoring and mitigation measures along with additional odor control efforts. The haul distance would also significantly increase either the time required to complete the remedy or the number of trucks involved – although this is an issue with South Quarry as well. (Multiple relevant factors remain to be determined, but this may be on the order of a twenty percent increase.) Equipment

moving waste to this location may also create compl ications for existing operations, such as the transfer station and the leachate treatment plant.

44 RECOMMENDED RELOCATION AREAS

As discussed above, the most attractive option is to use locations in the South Quarry that already require filling for other reasons. By making use o f existing infrastructure already in place, this option minimizes disruption and reduces the creatio n of additional infrastructure. The North Quarry location also presents infrastructure advant ages, and is in close proximity to the excavation. However its available volume is very dependent on the selected barrier location.

The southeast corner of OU-1 Area 1 has advantages due to its proximity both to the excavation site and to existing infrastructure, but may have disadvantages relating to a future Area 1 remedy. The airspace available is dependent on the feasibil ity of bridging onto the North Quarry slopes. Lastly, the OU-2 location has more than sufficient airspace for waste remaining after other options are consumed, but presents several logistical challenges.

The barrier location and design will determine the volume of waste to be relocated, and also the capacities of some locations discussed here. Once those factors are known, then an assessment may be made as to which of these locations (or whic h combinations of locations) is most attractive.

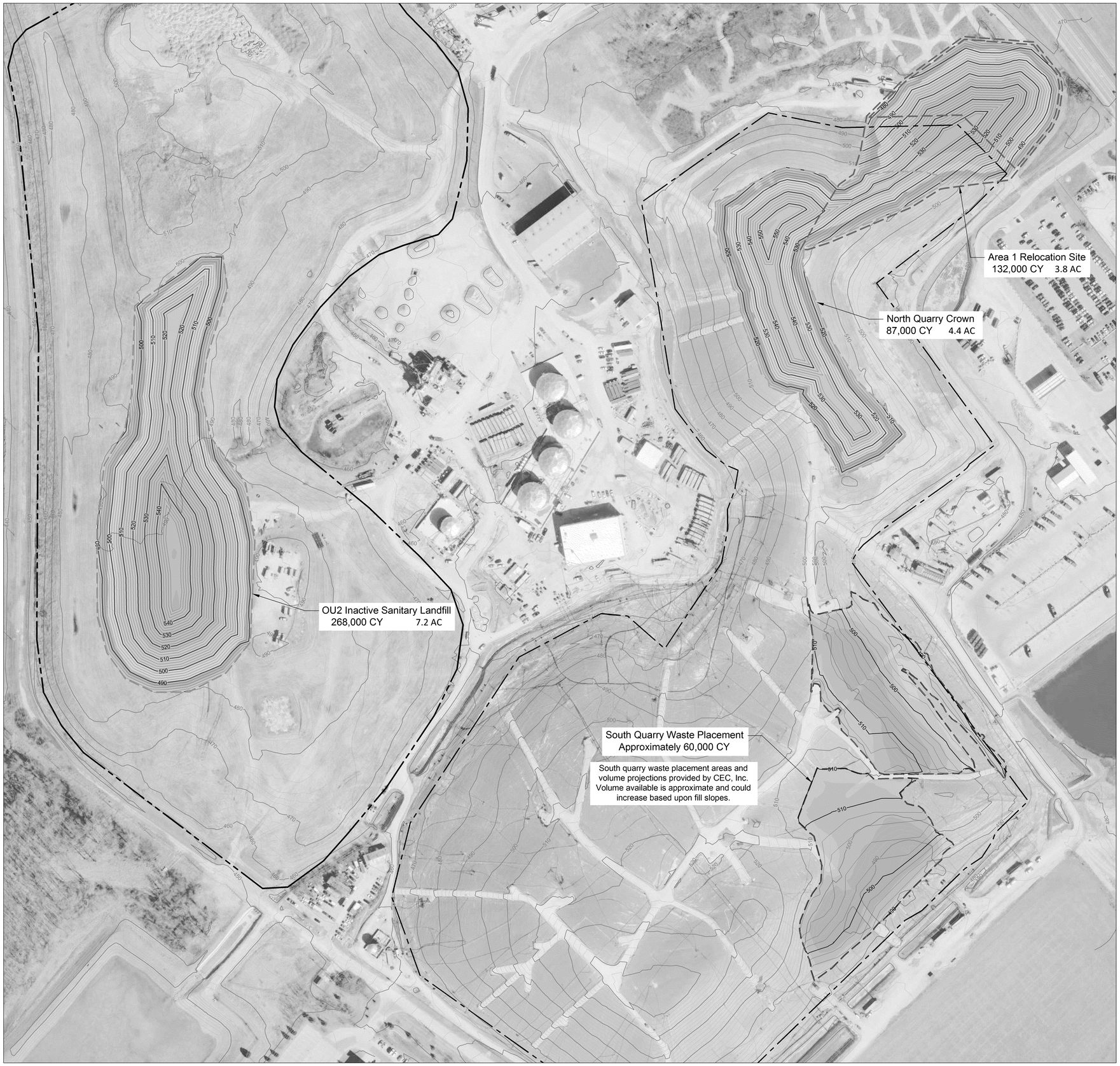
Approximate capacities of the relocation alternativ es are summarized in the chart below, along with estimates of net available airspace after pote ntial infrastructure considerations. While geotechnical stability analyses will need to be con ducted during the design phase, for this discussion grading will be assumed to use 3:1 slopes.

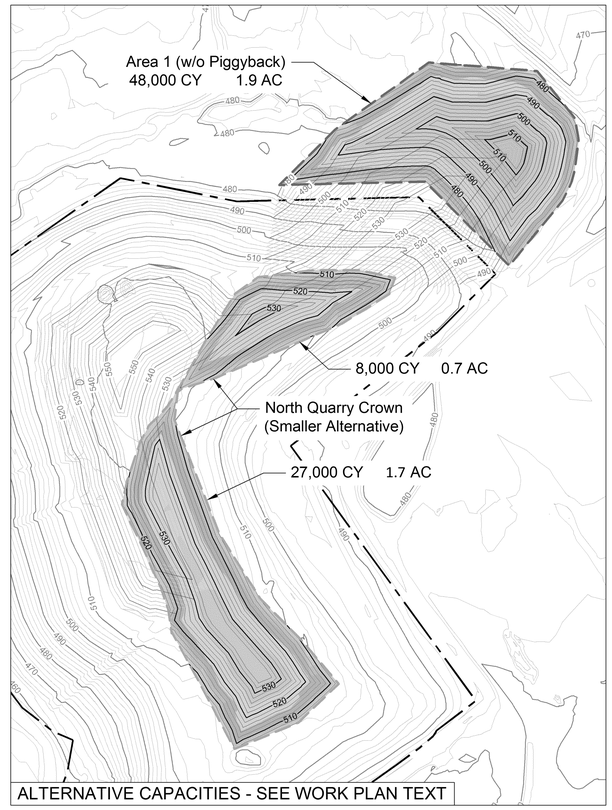
Estimated Airspace by Location	Airspace (cy)	Available Airspace (cy)
South Quarry Fills	60,000	60,000
North Quarry Crown (Large)	87,000	80,000
North Quarry Crown (Small)	34,000	30,000
Area 1 Corner (Bridged to N.Quarry*)	132,000	94,000
Area 1 Corner (Reduced)	48,000	29,000
OU-2 Crown	268,000	196,000
Preliminary estimate of airspace required: *65,000 to 125,000 cy*		
** See overlap description in Section 3.3*		

55 REFERENCES

Engineering Management Support, Inc. (EMSI), 2011, Supplemental Feasibility Study, West Lake Landfill Operable Unit-1, December 28.

EMSI, 2014, Work Plan for Removal Action Preconstru ction Work, West Lake Landfill Superfund Site, May 16, 2014, revised June 20, 2014.





Thickness Map			
Range	Minimum Depth	Maximum Depth	Color
1	-3	-2	
2	-2	0	
3	0	2	
4	2	4	
5	4	8	
6	8	16	
7	16	32	
8	32	64	

0 100 200 Feet

LEGEND

- 2014 TOPOGRPAHY (2' CONTOURS)
- 490 — 2014 TOPOGRPAHY (10' CONTOURS)
- RELOCATED WASTE GRADING (2' CONTOURS)
- 490 — RELOCATED WASTE GRADING (10' CONTOURS)
- RELOCATED WASTE GRADING BOUNDARY
- BRIDGETON LANDFILLL WASTE LIMITS
- OU-2 BOUNDARY

NOTES:
x ALL AIRSPACE CAPACITIES AND AREAS ARE APPROXIMATE
x 2014 TOPOGRAPHY PROVIDED BY COOPER AERIAL SURVEYS CO. AND IS DATED MARCH 20, 2014

WEST LAKE LANDFILL
13570 ST. CHARLES ROCK ROAD
BRIDGETON, MISSOURI 63044

WEST LAKE LANDFILL OU-1
THERMAL ISOLATION BARRIER

WASTE RELOCATION OPTIONS

Engineering for a Better World
FEEZOR ENGINEERING, INC.

JULY 2014
DESIGNED BY: PML
APPROVED BY: DRF

PROJECT NUMBER: BT-032 | FILE PATH:

REVISION | DATE

FIGURE:
1